



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PA 19406-1415
January 28, 2011

Mr. George H. Gellrich, Vice President
Calvert Cliffs Nuclear Power Plant, LLC
Constellation Energy Nuclear Group, LLC
1650 Calvert Cliffs Parkway
Lusby, MD 20657-4702

SUBJECT: CALVERT CLIFFS NUCLEAR POWER PLANT - NRC TRIENNIAL FIRE
PROTECTION INSPECTION REPORT 05000317/2010007 AND
05000318/2010007 AND EXERCISE OF ENFORCEMENT DISCRETION

Dear Mr. Gellrich:

On December 17, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Calvert Cliffs Nuclear Power Plant. The enclosed inspection report documents the inspection results, which were discussed on December 17, 2010, with you and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations, and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel. The scope of the inspection was reduced, in accordance with Inspection Procedure 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)," issued on December 24, 2009, as a result of your ongoing project to convert your fire protection program to the performance-based methodology as described in National Fire Protection Association Standard 805. The inspectors also reviewed mitigation strategies for addressing large fires and explosions.

The report documents three NRC-identified violations for which the NRC is exercising enforcement discretion. Two of the violations involved failures by Constellation Energy Nuclear Group (CENG) to provide alternative or dedicated shutdown capability that would maintain reactor coolant inventory, as required by Section III.L.1 of Appendix R to 10 CFR 50. Both of these two violations involved CENG's failure to provide alternative or dedicated shutdown capability that maintained reactor coolant inventory during a postulated fire in the cable spreading room, an alternative shutdown fire area. In the first violation, CENG failed to assure that one charging pump would remain free of fire damage for cable spreading room fire scenarios that could produce a spurious closure of the volume control tank motor-operated outlet valve, which would isolate the normal suction flow path to all charging pumps. In the second violation, CENG did not adequately evaluate the consequences of two pressurizer pilot operated relief valves (PORVs) opening from a single spurious operation. The third violation involved CENG's failure to provide alternative or dedicated shutdown capability that accommodated post fire conditions where offsite power is not available for 72 hours, contrary to Section III.L.3 of Appendix R to 10 CFR 50. Specifically, CENG provided procedural instructions to start the 0C emergency diesel generator (EDG), the credited onsite power source, prior to a control room or cable spread room fire requiring abandonment. However, CENG did not verify that a single spurious operation within the fire area would not adversely affect the operation of the 0C EDG as alternate shutdown control was established.

The NRC concluded that each of these violations represent issues that would be of very low safety significance (Green). Based on the results of the NRC's inspection and assessment, I have been authorized, after consultation with the Director, Office of Enforcement, and the Regional Administrator, to exercise enforcement discretion in accordance with Section 9.1 of the Enforcement Policy, "Enforcement Discretion for Certain Fire Protection Issues (10 CFR 50.48)," and NRC Inspection Manual Chapter 0305, Section 12.01.b, "Violations in Specified Areas of Interest Qualifying for Enforcement Discretion," and refrain from issuing enforcement for this violation.

In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

A handwritten signature in black ink, appearing to read "Darrell J. Roberts", written over a horizontal line.

Darrell J. Roberts, Director
Division of Reactor Safety

Docket Nos.: 50-317, 50-318
License Nos.: DPR-53, DPR-69

Enclosure: Inspection Report No. 05000317/2010007 and 05000318/2010007
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In accordance with Title 10 of the Code of Federal Regulations Part 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system, Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Darrell J. Roberts, Director
Division of Reactor Safety

Docket Nos.: 50-317, 50-318
License Nos.: DPR-53, DPR-69

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U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket No.: 50-317, 50-318

License No.: DPR-53, DPR-69

Report No.: 05000317/2010007, 05000318/2010007

Licensee: Constellation Energy Nuclear Group, LLC

Facility: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Location: Lusby, MD

Dates: November 29 – December 17, 2010

Inspectors: K. Young, Senior Reactor Inspector, DRS (Team Leader)
C. Cahill, Senior Reactor Analyst, DRS
R. Fuhrmeister, Senior Reactor Inspector, DRS
D. Orr, Senior Reactor Inspector, DRS
B. Purnell, Project Manager, NRR/Division of Policy and
Rulemaking/Power Uprate and Generic Communications Branch
(Observer)

Approved by: John F. Rogge, Chief
Engineering Branch 3
Division of Reactor Safety

SUMMARY OF FINDINGS

IR 05000317/2010007, 05000318/2010007; 11/29/2010 – 12/17/2010; Calvert Cliffs Nuclear Power Plant (CCNPP), Units 1 and 2; Triennial Fire Protection Team Inspection.

The report covered a two-week triennial fire protection team inspection by specialist inspectors from the Region I office. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

Additionally, Constellation Energy Nuclear Group (CENG) has committed to converting the Calvert Cliffs Nuclear Power Plant fire protection program to one which meets 10 CFR 50.48(c), National Fire Protection Association (NFPA) Standard 805. As a result of NRC enforcement policy changes applicable to plants in the process of transitioning to NFPA 805, three issues were identified and documented in this inspection report but were subject to enforcement discretion (Section 1R05.05).

No findings were identified.

REPORT DETAILS

Background

This report presents the results of a triennial fire protection inspection conducted in accordance with NRC Inspection Procedure (IP) 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)." The objective of the inspection was to assess whether Constellation Energy Nuclear Group (CENG) has implemented an adequate fire protection program and that post-fire safe shutdown capabilities have been established and were being properly maintained at the Calvert Cliffs Nuclear Power Plant (CCNPP). The following fire areas were selected for detailed review based on risk insights from the Individual Plant Examination (IPE)/Individual Plant Examination of External Events (IPEEE):

- FA-16
- FA-25
- FA-28
- FA-42

Inspection of these areas/zones fulfills the inspection procedure requirement to inspect a minimum of three samples.

The inspection team evaluated CENG's fire protection program against applicable requirements which included plant Technical Specifications, Operating License Condition 2.E, NRC Safety Evaluations, 10 CFR 50.48, and 10 CFR 50, Appendix R. The team also reviewed related documents that included the Updated Final Safety Analysis Report (UFSAR), the Fire Hazards Analysis (FHA), and the post-fire safe shutdown analyses.

Specific documents reviewed by the team are listed in the attachment.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R05 Fire Protection (IP 71111.05TTP)

.01 Protection of Safe Shutdown Capabilities

a. Inspection Scope

The team reviewed the FHA, safe shutdown analyses, and supporting drawings and documentation, to evaluate the fire protection of safe shutdown equipment and capabilities. The team compared the separation requirements described in the UFSAR and in 10 CFR 50, Appendix R, Section III.G, to the designed and installed fire protection features for credited safe shutdown equipment, including their supporting power, control, and instrumentation cables to assess the protection adequacy of safe shutdown capabilities. The team's review included an assessment of the adequacy of the selected

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systems for reactivity control, reactor coolant makeup, reactor heat removal, process monitoring, and associated support system functions.

The team reviewed procedures and programs for the control of ignition sources and transient combustibles to assess their effectiveness in preventing fires and in controlling combustible loading less than the analyzed limits established in the FHA. The team reviewed selected hot work permits, transient combustible control, and fire protection program evaluations to assess the adequacy of the fire protection program administrative control. During plant walkdowns, the team observed permanent and transient combustibles loading and potential ignition sources to independently verify whether the installed protective features were being properly maintained and administrative controls were being adequately implemented.

b. Findings

No findings were identified.

.02 Passive Fire Protection

a. Inspection Scope

The team walked down accessible portions of the selected fire areas to evaluate whether the observed material conditions of the fire area boundaries were adequate for the fire hazards in the area. The team compared the fire area boundaries, including walls, fire doors, fire dampers, penetration fire barrier seals, and redundant equipment fire barriers to design basis requirements, industry standards, and the CCNPP fire protection program, as approved by the NRC, to identify degradation or non-conformances.

The team reviewed selected engineering evaluations, installation work orders, and qualification records for a sample of penetration fire barrier seals to determine whether the fill material was properly installed and whether the as-left configuration satisfied design requirements for the intended fire rating. There were no credited fire protection wraps in the selected fire areas.

In addition, the team reviewed the most recent test results for fire damper functionality tests and inspection records of penetration fire barrier seals and fire separation barriers for the selected fire areas, to verify whether the inspection and testing was adequately conducted, the acceptance criteria were met, and any potential performance degradation was identified.

b. Findings

No findings were identified.

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.03 Active Fire Protection

a. Inspection Scope

The team evaluated the fire detection and suppression systems in the selected fire areas to determine whether they were installed, tested, maintained, and operated in accordance with NRC requirements and approved exemptions, NFPA codes of record, and the fire protection program, as approved by the NRC. The team also assessed whether the suppression systems capabilities were adequate to control and/or extinguish fires associated with the hazards in the selected areas. The team reviewed initial discharge testing, design specifications, modifications, and engineering evaluations for the Halon suppression systems for the Unit 1 cable spreading room and the Unit 2 45' switchgear room. The team also reviewed and walked down the associated fire fighting strategies and Halon operating procedures. The walk down of the suppression systems included an assessment of the material condition of the systems and components.

The team reviewed the design capability of the fire water supply system to verify whether the design basis and NFPA code requirements for the hazards involved were adequately satisfied. The team reviewed the fire water system hydraulic analyses and assessed the adequacy of the underground fire loop flow tests to verify whether the tests adequately demonstrated that the flow distribution circuits were able to meet design basis requirements. The team evaluated the motor-driven and diesel-driven fire pump capacity tests to assess the adequacy of the test acceptance criteria. In addition, the team reviewed the most recent pump and loop flow test results to verify whether the testing was adequately conducted, the acceptance criteria were met, and any potential performance degradation was identified.

The team walked down accessible portions of the detection and suppression systems in the selected areas and major portions of the fire water system supply system, including motor-driven and diesel-driven fire pumps, fire water storage tanks, interviewed cognizant engineers, and reviewed open condition reports (CRs) to assess the material condition of the systems and components. In addition, the team reviewed the most recent test results for the 2B diesel generator room and the Unit 1 auxiliary feed water (AFW) pump room sprinkler systems, and for the smoke and heat detectors for the selected fire areas, to verify whether the testing was adequately conducted, the acceptance criteria were met, and any potential performance degradations was identified.

The team assessed the fire brigade capabilities by reviewing training, qualification, and drill critique records. In addition, the team interviewed site fire brigade personnel to better assess the site fire fighting capabilities. The team reviewed site fire fighting strategies (i.e. pre-fire plans) and smoke removal plans for the selected fire areas to determine if appropriate information was provided to fire brigade members and plant operators to identify safe shutdown equipment and instrumentation, and to facilitate suppression of a fire that could impact post-fire safe shutdown capability. The team independently inspected the fire brigade equipment, including personnel protective gear

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(e.g. turnout gear) and smoke removal equipment, to determine operational readiness for fire fighting.

b. Findings

No findings were identified.

.04 Protection from Damage from Fire Suppression Activities

a. Inspection Scope

The team walked down the selected fire areas and adjacent areas, and reviewed selected documents to determine whether redundant safe shutdown trains could be potentially damaged from fire suppression activities or from the rupture or inadvertent operation of fire suppression system. Specifically, to determine whether a potential existed to damage redundant safe shutdown trains, the team evaluated whether:

- A fire in one of the selected fire areas would not release smoke, heat or hot gases that could cause unintended activation of suppression systems in adjacent fire areas which could potentially damage all redundant safe shutdown trains;
- A fire suppression system rupture, inadvertent actuation, or actuation due to a fire, in one of the selected fire areas, could not directly damage all redundant trains (e.g. sprinkler caused flooding of other than the locally affected train); and,
- Adequate drainage was provided in areas protected by water suppression systems.

b. Findings

No findings were identified.

.05 Alternative Shutdown Capability

a. Inspection Scope

Methodology

The team reviewed the safe shutdown analysis, operating procedures, piping and instrumentations drawings (P&IDs), electrical drawings, the UFSAR, and other supporting documents to evaluate whether the licensee could achieve and maintain hot and cold shutdown from outside the control room, for fire scenarios that rely on a shutdown methodology from outside the control room. The team assessed the licensee's ability to shutdown the plant from outside the control room with and without the availability of offsite power. Plant walkdowns were also performed to independently verify whether the plant configuration was consistent with that described in the safe shutdown and fire hazards analysis. The team's review focused on systems selected for reactivity control, reactor coolant makeup, reactor decay heat removal, process monitoring instrumentation, and support system functions to assess the adequacy of the

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selected systems. In addition, the team assessed the systems and components credited for use during the shutdown to determine whether they would remain free from fire damage. The team reviewed the transfer of control from the control room to the alternative shutdown locations to verify whether it would not be affected by fire-induced circuit faults (e.g. by the provision of separate fuses and power supplies for alternative shutdown control circuits).

Similarly, for fire scenarios that relied on a shutdown from the control room, the team also evaluated the shutdown methodology to verify the adequacy of selected components and systems to achieve and maintain safe shutdown conditions.

Operational Implementation

The team reviewed the training program for licensed and non-licensed operators to assess training adequacy for alternative shutdown systems and procedures. In addition, the team evaluated operator minimum shift staffing requirements to verify whether an adequate number of operators were available on-site at all times, exclusive of those assigned as fire brigade members, to perform fire related safe shutdown activities using either the normal or alternative shutdown systems.

The team reviewed the procedures utilized for post-fire shutdown, walked down key equipment and control stations, and performed a table top walk through of selected procedure steps to independently assess human factor elements and procedure adequacy. The team also evaluated the available time to assess whether operators could reasonably perform the specific actions needed to maintain plant parameters within specified limits. Specifically, the team evaluated the time critical operator actions to restore alternating current (AC) electrical power, transfer operational command and control from the main control room to the remote shutdown panel, establish reactor coolant make-up, and establish decay heat removal.

Specific procedures reviewed for alternative shutdown, including shutdown from outside the control room included the following:

- AOP-9B, Safe Shutdown due to a Severe Cable Spreading Room Fire, Unit 1, Rev. 17;
- AOP-9Q, Safe Shutdown due to a Severe Fire in Room 407, Unit 2 Switchgear Room 45', Rev. 11; and
- AOP-9R, Safe Shutdown due to a Severe Fire in Room 603, Unit 1 Auxiliary Feed Pump Room, Rev. 12.

The team reviewed selected operator manual actions to determine whether the licensee had adequately validated and verified that the actions could be implemented in accordance with approved procedures, and in the time necessary to support the safe shutdown method of each reviewed fire area. In addition, the team reviewed the most recent test results for alternative shutdown transfer capability, and instrumentation and control functions, to verify whether the testing was adequately conducted, the acceptance criteria were met, and any potential performance issues were identified, to ensure the alternative shutdown capability remained functional.

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b. Findings

.1 Postulated Spurious Closure of Volume Control Tank Outlet Valve Results in Loss of Charging Pumps

Introduction. The team identified a violation of very low safety significance of 10 CFR 50, Appendix R, III.L.1, in that CENG failed to provide alternative or dedicated shutdown capability that maintained reactor coolant inventory during a postulated fire in the cable spreading room, an alternative shutdown fire area. Specifically, CENG failed to assure that one charging pump would remain free of fire damage for cable spreading room fire scenarios that could produce a spurious closure of the volume control tank (VCT) motor-operated outlet valve (1 or 2-CVC-501-MOV), which would isolate the normal suction flow path to all charging pumps. However, this issue was determined to satisfy the criteria specified for the exercise of enforcement discretion for plants in transition to a fire protection program that meets the requirements of 10 CFR 50.48(c), NFPA 805.

Description. While evaluating the alternative shutdown capability for CCNPP, Unit 1, the team questioned CENG's evaluation and associated operator actions to cope with a fire in the cable spread room that could spuriously close the VCT outlet motor operated valve (MOV). Closure of the VCT outlet MOV would isolate the normal suction path to an operating charging pump and likely cause damage in a short time period to an operating charging pump. CENG reviewed the team's question and additionally considered that all charging pumps could potentially be affected because a control circuit would automatically start all charging pumps from a pressurizer level deviation set-point that may be reached during a reactor trip condition. CENG concluded that for the deterministic analysis of an alternative shutdown fire area such as the cable spread room, all trains of charging could be postulated unavailable. At least one train of charging is required to achieve and maintain safe shutdown at CCNPP, Units 1 and 2. CENG considered the following assumptions during their review of the fire scenario: (1) a single spurious operation from the effects of fire that spuriously closes the VCT outlet MOV as operators transition to establish alternative shutdown control, (2) loss of offsite power conditions do not exist, and (3) no credit for an automatic control circuits that trip the charging pumps on low suction pressure.

Additionally, the team noted that based on operator timeline data from June 2010, an operating charging pump under these alternative shutdown analysis assumptions would operate for about thirty minutes before it was locally secured at the electrical switchgear and an alternate suction path established from the boric acid storage tanks. The team considered that charging pumps under such conditions may not be able to perform their intended safety function (provide makeup to the reactor coolant system in hot standby conditions following a fire requiring use of alternate shutdown equipment).

Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.1, requires in part that alternative shutdown capability provided for a specific fire area shall be able to maintain reactor coolant inventory. CENG did not meet this requirement and failed to protect a charging pump, required for hot standby, from a circuit failure causing a spurious closure of the VCT outlet MOV. CENG initiated condition report CR-2010-012728 for long term

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resolution and promptly initiated a procedure change to open the refueling water tank (RWT) outlet valve prior to leaving the control room. The team concluded that CENG's interim compensatory measures were commensurate with the risk significance.

Analysis. CENG's failure to ensure a charging pump was available due to a spurious closure of the VCT outlet MOV is a performance deficiency. This finding is more than minor because it is associated with the External Factors attribute (fire) of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e. core damage). Specifically, the availability of the charging system was not ensured for a cable spread room fire scenario that spuriously closes the VCT outlet MOV.

As stated above, CENG entered this issue into the corrective action program (reference CR-2010-012728) and promptly initiated a procedure change to open the RWT outlet valve prior to leaving the control room. In addition, CENG completed a bounding risk assessment of this postulated fire-induced condition to estimate the risk associated with this alternate safe shutdown vulnerability. An NRC senior reactor analyst (SRA) reviewed CENG's evaluation, PRAER No. C0-2010-020, Rev. 1, and concluded that the assessment assumptions and risk quantification methodologies were appropriately conservative. Accordingly, the SRA agrees with CENG's risk estimate for this condition and concludes that this NRC-identified issue would be of very low safety significance (Green). The team concluded that CENG's corrective action to revise the alternate post-fire safe shutdown procedures was commensurate with the risk significance.

Cross-cutting aspects are not applicable to findings involving enforcement discretion.

Enforcement. Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.1, requires in part that alternative shutdown capability provided for a specific fire area shall be able to maintain reactor coolant inventory. Contrary to the above, on December 15, 2010, the NRC identified that CENG did not meet this requirement for the Unit 1 and Unit 2 cable spread room fire areas and failed to maintain reactor coolant inventory and protect a charging pump from a postulated fire-induced circuit failure resulting in the spurious closure of the VCT outlet MOV. The violation was a legacy issue in existence since the inception of the post-fire safe shutdown analysis at CCNPP, Units 1 and 2.

CENG is in transition to NFPA 805 and therefore the NRC-identified violation was evaluated in accordance with the criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR Part 50.48) for a licensee in NFPA 805 transition. Specifically, although the NRC identified the violation, it is likely that CENG would have identified and corrected this issue as part of the transition to NFPA 805, CENG entered the issue into the corrective action program (CR 2010-012728), CENG implemented compensatory measures in a reasonable time commensurate with the risk significance, the issue was not likely to have been previously identified by routine CENG efforts, and the violation was not willful. Because all the criteria were met, the NRC is exercising enforcement discretion for this issue.

Enclosure

.2 Postulated Single Spurious Operation Results in Both Pressurizer Pilot Operated Relief Valves Opening and Loss of Subcooling Margin for Several Hours

Introduction. The team identified a violation of very low safety significance of 10 CFR 50, Appendix R, III.L.1, in that CENG failed to provide alternative or dedicated shutdown capability that maintained reactor coolant inventory during a postulated fire in the cable spread room, an alternative shutdown fire area. Specifically, CENG did not adequately evaluate the consequences of two pressurizer pilot operated relief valves (PORVs) opening from a single spurious operation. However, this issue was determined to satisfy the criteria specified for the exercise of enforcement discretion for plants in transition to a fire protection program that meets the requirements of 10 CFR 50.48(c), NFPA 805.

Description. While evaluating the alternative shutdown capability, the team questioned CENG's evaluation of a fire in the Unit 1 cable spread room that could spuriously open both PORVs. A single cable from the cable spread room to the control room existed and if a hot short developed, both PORVs would spuriously open. AOP-9B-1, Safe Shutdown Due to a Severe Cable Spreading Room Fire, Rev. 17, included procedure instructions for manual actions to close the PORVs. However, during simulated timeline validations of alternate shutdown in June 2010, those manual actions were demonstrated to take about 11 and 14 minutes for each PORV respectively. CENG had previously evaluated an alternative shutdown fire scenario that opened both PORVs in calculation CA04007, Appendix R Analysis of Inadvertent Lifting of Both Pressurizer PORVs, Rev. 0. The calculation included conservatism to account for possible uncertainties in the manual action times: 16 and 19 minutes to close the PORVs was used instead of 11 and 14 minutes.

The calculation results determined that subcooling was lost early in the transient and was not recovered until charging was restored, the head void collapsed, and pressurizer level and heaters were restored. The calculation also determined that due to the significant mass loss from the reactor coolant system and limited charging availability (only one charging pump), subcooling margin would not be restored for about 8 hours. The team noted that although fuel damage was not calculated to occur, the results of the calculation, existence of a reactor head void and zero subcooling margin, was not acceptable to assure the plant was not placed in an unrecoverable condition.

Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.1, requires in part that alternative shutdown capability provided for a specific fire area shall be able to maintain reactor coolant inventory. CENG did not meet this requirement and failed to maintain subcooling margin and prevent a reactor head void from occurring for a postulated cable spread room fire that spuriously opens both PORVs. CENG initiated condition report CR-2010-012760 for long term resolution and promptly initiated fire watches in the cable spread room. The team concluded that CENG's interim compensatory measures were commensurate with the risk significance.

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Analysis. CENG's failure to ensure that subcooling margin was maintained and a reactor head void did not occur during a postulated cable spreading room fire that opens both PORVs is a performance deficiency. This finding is more than minor because it is associated with the External Factors attribute (fire) of the Initiating Events Cornerstone and adversely affects the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.

As stated above, CENG entered this issue into the corrective action program (reference CR-2010-012760) and promptly initiated fire watches in the cable spreading room. In addition, CENG completed a bounding risk assessment of this postulated fire-induced condition to estimate the risk associated with this alternate safe shutdown vulnerability. An NRC SRA reviewed CENG's evaluation, PRAER No. C0-2010-021, Rev. 0, and concluded that the assessment assumptions and risk quantification methodologies were appropriately conservative. Accordingly, the SRA agrees with CENG's risk estimate for this condition and concludes that this NRC-identified issue would be of very low safety significance (Green). The team concluded that CENG's interim compensatory measures to maintain fire watches in the cable spreading room areas until final resolution of the issue is completed was commensurate with the risk significance.

Cross-cutting aspects are not applicable to findings involving enforcement discretion.

Enforcement. Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.1 requires in part that alternative shutdown capability provided for a specific fire area shall be able to maintain reactor coolant inventory. Contrary to the above, on December 15, 2010, the NRC identified that CENG did not meet this requirement for the Unit 1 and Unit 2 cable spreading room fire areas and failed to maintain reactor coolant inventory during a postulated fire-induced circuit failure resulting in the spurious opening of both PORVs. The violation existed since November 24, 1997, when results from calculation CA04007, Appendix R Analysis of Inadvertent Lifting of Both Pressurizer PORVs, determined that a potential unrecoverable condition existed in the reactor for a postulated fire scenario.

CENG is in transition to NFPA 805 and therefore the NRC-identified violation was evaluated in accordance with the criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR Part 50.48) for a licensee in NFPA 805 transition. Specifically, although the NRC identified the violation, it is likely that CENG would have identified and corrected this issue as part of the transition to NFPA 805, CENG entered the issue into the corrective action program (CR 2010-012760), CENG implemented compensatory measures in a reasonable time commensurate with the risk significance, the issue was not likely to have been previously identified by routine CENG efforts, and the violation was not willful. Because all the criteria were met, the NRC is exercising enforcement discretion for this issue.

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.3 Postulated Single Spurious Operation Adversely Affects Credited Onsite Power Source for a Control Room Fire Scenario

Introduction. The team identified a violation of very low safety significance of 10 CFR 50, Appendix R, III.L.3, in that CENG failed to provide alternative or dedicated shutdown capability that accommodated post fire conditions where offsite power is not available for 72 hours. Specifically, CENG provided procedure instructions to start the 0C emergency diesel generator (EDG), the credited onsite power source, prior to a control room or cable spread room fire requiring abandonment. However, CENG did not verify that a single spurious operation within the fire area would not adversely affect the operation of the 0C EDG as alternate shutdown control was established. However, this issue was determined to satisfy the criteria specified for the exercise of enforcement discretion for plants in transition to a fire protection program that meets the requirements of 10 CFR 50.48(c), NFPA 805.

Description. While evaluating the alternative shutdown capability, the team questioned CENG's evaluation of a fire in the Unit 1 cable spread room that could spuriously secure the switchgear that supported the 0C EDG engine auxiliaries. Step IV.C.1.e., of procedure AOP-9B, directed operators to start the 0C EDG prior to control room abandonment. Additionally, the inspectors noted that the 0C EDG was not locally isolated from the effects of a cable spread room fire for about 30 minutes based on June 2010, timeline validations of AOP-9A, Control Room Evacuation and Safe Shutdown Due to a Severe Control Room Fire. The procedure steps of AOP-9A and AOP-9B, Safe Shutdown Due to a Severe Cable Spreading Room Fire are very similar.

CENG reviewed the team's question and validated that 0C EDG control cables did not pass through the cable spread room as part of the 1C cable chase. Additionally, CENG's extent of condition review determined that 0C EDG speed and voltage control circuits were also potentially affected. The engine auxiliaries supported by electrical switchgear subject to spurious de-energizing during this scenario were the radiator cooling fans.

Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.3, requires in part that alternative shutdown capability shall accommodate post fire conditions where offsite power is not available for 72 hours. CENG did not meet this requirement and failed to maintain the 0C EDG free of fire effects for a postulated cable spread room or control room fire that affected the 0C EDG switchgear, speed control, and voltage control circuits. CENG initiated condition report CR 2010-012816 for long term resolution and promptly initiated fire watches in the control room and cable spread room fire areas (another alternative shutdown area where the affected cables are routed.) The team concluded that CENG's interim compensatory measures were commensurate with the risk significance.

Analysis. CENG's failure to ensure the 0C EDG was available during all postulated control room or cable spread room fire scenarios requiring post-fire alternative shutdown is a performance deficiency. This finding is more than minor because it is associated with the External Factors attribute (fire) of the Mitigating Systems Cornerstone and adversely affects the cornerstone objective to ensure the availability, reliability, and

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reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the availability of the OC EDG was not ensured for a control room fire scenario that spuriously trips the OC switchgear of adversely affects speed and voltage control circuits.

As stated above, CENG entered this issue into the corrective action program (reference CR-2010-012816) and promptly initiated fire watches in all affected areas. In addition, CENG completed a bounding risk assessment of this postulated fire-induced condition to estimate the risk associated with this alternate safe shutdown vulnerability. An NRC SRA reviewed CENG's evaluation, PRAER No. C0-2010-022, Rev. 0, and concluded that the assessment assumptions and risk quantification methodologies were appropriately conservative. Accordingly, the SRA agrees with CENG's risk estimate for this condition and concludes that this NRC-identified issue would be of very low safety significance (Green). The team concluded that CENG's interim compensatory measures to maintain fire watches in the affected areas until final resolution of the issue is completed was commensurate with the risk significance.

Cross-cutting aspects are not applicable to findings involving enforcement discretion.

Enforcement. Appendix R to 10 CFR 50, Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979, Section III.L.3, requires in part that alternative shutdown capability shall accommodate post-fire conditions where offsite power is not available for 72 hours. Contrary to the above, December 17, 2010, the NRC identified that CENG did not meet this requirement for the Unit 1 and Unit 2 control room fire areas and failed to maintain the OC EDG free of the effects during a postulated fire-induced circuit failure. This violation existed since September 11, 2001, when procedure instructions were included in AOP-9A, Safe Shutdown Due to a Severe Control Room Fire, Rev. 9, to start the OC EDG prior to isolating all OC EDG circuits from the fire area.

CENG is in transition to NFPA 805 and therefore the NRC-identified violation was evaluated in accordance with the criteria established by Section A of the NRC's Interim Enforcement Policy Regarding Enforcement Discretion for Certain Fire Protection Issues (10 CFR Part 50.48) for a licensee in NFPA 805 transition. Specifically, although the NRC identified the violation, it is likely that CENG would have identified and corrected this issue as part of the transition to NFPA 805, CENG implemented compensatory measures in a reasonable time commensurate with the risk significance, the issue was not likely to have been previously identified by routine CENG efforts, and the violation was not willful. Because all the criteria were met, the NRC is exercising enforcement discretion for this issue.

.06 Circuit Analysis

a. Inspection Scope

NRC Inspection Procedure 71111.05TTP, "Fire Protection-NFPA 805 Transition Period (Triennial)," reduces the scope of this inspection by specifically excluding review of

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circuit configurations for plants transitioning their fire protection program to the requirements of NFPA 805.

The team reviewed circuit breaker coordination studies to assess whether equipment needed to support post-fire safe shutdown activities could be impacted due to inadequate over-current coordination. Additionally, the team reviewed a sample of circuit breaker maintenance records to verify whether the circuit breakers for components required for post-fire safe shutdown were properly maintained in accordance with approved procedures.

b. Findings

No findings were identified.

.07 Communications

a. Inspection Scope

The team reviewed selected fire related safe shutdown procedures, the FHA, the safe shutdown analysis, and associated documents to assess whether the expected method of communications would be available during and following a fire. During this review, the team considered the effects of ambient noise levels, clarity of reception, reliability, and coverage patterns. The team inspected the designated emergency storage lockers to verify whether sufficient portable radios would be available for the fire brigade and operators. In addition, the team assessed whether communications equipment, such as sound powered phone system cables, repeaters, transmitters, and uninterruptable and back-up power supplies would be adversely affected by a fire.

b. Findings

No findings were identified.

.08 Emergency Lighting

a. Inspection Scope

The team walked down the emergency lights in the selected fire areas to independently evaluate the placement and coverage areas of the lights. The team assessed whether the lights provided adequate illumination on local equipment and instrumentation required for post-fire safe shutdown, to ensure local operations could be reliably performed under expected post-fire conditions. Emergency light placement was also evaluated to determine adequate illumination of local area access and egress pathways.

The team verified whether the emergency light batteries were rated for at least an eight-hour capacity. Preventive maintenance procedures, the vendor manual, completed surveillance tests, and battery replacement practices were also reviewed to evaluate the

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emergency lighting was being maintained in a manner that would ensure reliable operation.

c. Findings

No findings were identified.

.09 Cold Shutdown Repairs

a. Inspection Scope

The team reviewed cold shutdown repair procedures for selected components which might be damaged by a fire, to determine whether a cold shutdown could be achieved within the time specified in the design and licensing bases. The team also reviewed the associated equipment, materials, and tools needed to perform the repairs (e.g. pre-cut cables with lugs attached), to determine whether they were available and accessible on-site.

b. Findings

No findings were identified.

.10 Compensatory Measures

a. Inspection Scope

The team reviewed selected fire protection and post-fire safe shutdown equipment, systems, or features that were out-of-service, degraded, or inoperable (e.g. detection and suppression systems, passive fire barriers, pumps or valves, or electrical devices providing safe shutdown functions or capabilities) to determine whether the licensee had implemented appropriate compensatory measures. The team also evaluated selected short term compensatory measures to assess whether the degraded function or feature was adequately compensated until appropriate corrective action could be taken to return the equipment to service. In addition, the team assessed the licensee's effectiveness to return equipment to service in a reasonable period of time.

b. Findings

No findings were identified.

.11 Large Fires and Explosions Mitigation Strategies

a. Inspection Scope

The team reviewed the licensee's preparedness to handle large fires or explosions by reviewing four mitigating strategies to verify they continue to meet operating license conditions 2.C.(5) for Unit 1 and 2.C.(7) for Unit 2 by determining that:

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- Procedures are being maintained and adequate;
- Equipment is properly staged and is being maintained and tested; and,
- Station personnel are knowledgeable and can implement the procedures.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES [OA]

4OA2 Identification and Resolution of Problems (IP 71152)

.01 Corrective Actions for Fire Protection Deficiencies

a. Inspection Scope

The team reviewed a sample of condition reports associated with the fire protection program and post-fire safe shutdown issues to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with these areas, and whether the planned or completed corrective actions were appropriate. The reviewed CRs are listed in the attachment.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Exit Meeting Summary

The team presented the preliminary inspection results to Mr. G. Gellrich, Site Vice President, and other members of the site staff at an exit meeting on December 17, 2010. No proprietary information was included in this inspection report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

G. Gellrich, Site Vice President
T. Trepanier, Plant General Manager
F. Abell, Maintenance
M. Beckman, Maintenance
R. Bleacher, Operations Procedure Writer
B. Cooper, Fire Protection Engineering Consultant
G. Dare, Systems Engineer
C. Dobry, Fire Protection Engineer
M. Draxton, Training
B. Ficke, Emergency Preparedness
D. Fry, Manager, Operations
J. Grooms, Supervisor, WWC/FIN/FIRE
R. Haley, Operations Support, Fire Protection
M. Herron, Supervisor, Engineering
R. Henderson, Reactor Operator
R. Kreger, Performance Improvement
D. Kreller, Supervisor, Maintenance
D. Lauver, Director, Licensing
P. O'Malley, Director, QPA
T. Riti, Supervisor, Systems Engineering
K. Robinson, Manager, NSS
D. Sams, Supervisor, Mechanical Maintenance
S. Sanders, Engineer
A. Simpson, Supervisor, Licensing
L. Smith, Supervisor, Design Engineering
J. Stanley, Engineer
M. Stanley, Site Fire Marshal
R. Stark, Engineer, Electrical Design
C. Turner, Design Engineering, Appendix R Program

NRC

J. Rogge, Chief, Engineering Branch 3, Division of Reactor Safety
C. Cahill, Senior Reactor Analyst, Division of Reactor Safety
S. Kennedy, Senior Resident Inspector, Calvert Cliffs Nuclear Power Plant
M. Osborn, Resident Inspector, Calvert Cliffs Nuclear Power Plant

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

None

LIST OF DOCUMENTS REVIEWED

Calculations/Engineering Evaluation Reports

CA04007, Appendix R Analysis of Inadvertent Lifting of Both Pressurizer PORVs, Rev. 0
CA05974, 10 CFR 50 Appendix R Fire Protection Simulations, Rev. 0
D-E-94-001, Relay Settings & Coordination for 1A and 0C EDGs, Rev. 7
DCALC No. CA05974, 10 CFR, Appendix R Fire Protection AOP-9 Simulations, Rev. 00
ECP-10-000877
E-90-071, Relay Settings & Coordination for 4Kv Bus 14, Rev. 2
E-90-92, Breaker Coordination for 480V Bus 14B, Rev. 1
ER820816, Exemption Request for Appendix R, III.G.2, Barriers, 8/16/82
ER840314, Exemption Request for Appendix R, III.G.2, AFW/Service Water Pump Rooms, 6/4/84
ES-001, Flooding, Rev. 3
ES199901113, Instrument Air Functionality Due to Fire Effects, Rev. 0
Fire Protection Evaluation for Penetrations 1BPS601/603B001, 1BPS601/603B002,
2BPS605/606B001 and 2BPS605/606B002
FPEE-011, Determination of the Adequacy of the Penetrations between U1 CSR and CC1B &
Between CC1B and CC1A which do not have Fire Dampers, 12/27/90
FPEE-015, Evaluation of Exterior Walls of the Aux. Building as "Appendix R" or as
"Non-Appendix R," 7/6/92
FPEE-018, Fire Door Issues, 12/20/94
FPEE-024, Engineering Evaluation for Expansion Joint Repair, 12/8/95
FPEE-025, Seal for Unistrut Penetrating Wall, 2/22/96
FPEE-026, Evaluation of 16 Fire Dampers in Plant, 1/24/96
Interactive Cable Analysis for CCNPP, Rev. 6
I-91-13, Aux. Feedwater Air Pressure Setpoint, Rev. 1
I-92-060, Unit 1 AFW Air Accumulator Pressure Switch Setpoints, Rev. 0
Interactive Cable Analysis/Appendix R Evaluations, Rev. 7
M-91-94, AFW Water Inventory, Rev. 1
000-TH-9202, ADV/Natural Circulation Cooldown to Mode 5, Rev. 1

Condition Reports

IRE-023-627 IRE-027-159 IRE-029-199 IRE-031-227 IRE-032-927 IR3-073-329
 2009-001177 2009-004342 2009-005758 2009-006068 2009-006081 2009-007262
 2009-008541 2009-009007 2010-003995 2010-004833 2010-005555 2010-005584
 2010-005676 2010-006298 2010-007213 2010-011401 2010-011634 2010-011635
 *2010-011636 2010-011637 2010-011638 2010-011639 2010-011644 2010-011994
 2010-011995 2010-011996 *2010-012178 *2010-012215 *2010-012217 *2010-012233
 *2010-012255 *2010-012261 *2010-012267 *2010-012269 *2010-012273 *2010-012279
 *2010-012309 *2010-012333 *2010-012334 *2010-012335 *2010-012336 *2010-012356
 *2010-012357 *2010-012728 *2010-012749 *2010-012760 *2010-012793 *2010-012816

* NRC identified as a result of this inspection.

Completed Tests/Surveillances

F-290-0, Hose Station & Hydrant House Inspection, Rev. 00601, Completed 8/3/10 & 8/31/10
 F-291-0, Halon System Valve Position Verification, Rev. 5, Completed 8/3/10 & 8/31/10
 F-490-0-A, Fire Detection Instruments Functional Test, Rev. 3, Completed 11/5/07 & 10/19/09
 F-490-0-B, Fire Detection Instruments Functional Test, Rev. 3, Completed 5/21/08 & 4/1/10
 F-490-0-C, Fire Detection Instruments Functional Test, Rev. 3, Completed 9/29/09 & 10/17/10
 F-490-0-D, Fire Detection Instruments Functional Test, Rev. 3, Completed 5/2/07 & 4/2/09
 F-591-2, Inspection of Fire Doors & Watertight Doors, Rev. 10, Completed 8/2/08 & 2/2/10
 F-592-2, Penetration Fire Barrier Inspection, Rev. 7, Completed 10/17/08 & 1/30/09
 F-592-2, Penetration Fire Barrier Inspection, Rev. 00800, Completed 8/4/10 & 8/6/10
 F-690-0, Sprinkler System Inspection, Rev. 6, Completed 5/20/08
 F-697-0, Fire Suppression System Functional Test, Rev. 4, Completed 7/30/09
 M-698-1, Functional Test of Halon System for the Cable Spreading Room, Rev. 1,
 Completed 1/6/10
 M-699-2, Functional Test of Halon System for Switchgear Rooms, Rev. 5, Completed 7/24/08 &
 1/28/10
 STP 0-63-1, Remote Shutdown and Post Accident Monitoring Instr. Channel Check, Rev. 33,
 Completed 4/24/09
 1-102-54-O-SA, AOP/EOP Pre-staged Equipment, Rev. 23, Completed 5/12/10
 2-102-54-O-SA, AOP/EOP Pre-staged Equipment, Rev. 1901, Completed 10/11/10

Drawings and Wiring Diagrams

12129-0093SH0001, Auxiliary Logic Schematic Unit 1, Rev. 11
 60583SH0001, Auxiliary Feedwater System (Steam), Rev. 63
 60583SH0002, Auxiliary Feedwater System (Condensate), Rev. 2
 60700SH0001, Main Steam and Reheat, Rev. 47
 60700SH0002, Main Steam and Reheat, Rev. 27
 60700SH0003, Main Steam and Reheat, Rev. 20
 60706SH0001, Service Water Cooling – Turbine Area, Rev. 52
 60706SH0002, Service Water Cooling – Auxiliary Building & Containment, Rev. 75
 60710SH0001, Component Cooling System, Rev. 43
 60710SH0002, Component Cooling System, Rev. 37
 60710SH0003, Component Cooling System, Rev. 45
 60729SH0001, Reactor Coolant System, Rev. 78
 60729SH0003, Reactor Coolant Vacuum Refill Boundaries, Rev. 1
 60730SH0001, Chemical & Volume Control System, Rev. 87
 60730SH0002, Chemical & Volume Control System, Rev. 73
 60730SH0003, Chemical & Volume Control System, Rev. 44
 61001SH0001, Electrical Main Single Line Diagram, Rev. 42
 61030, Single Line Diagram, Vital 120V AC & 125V DC Emergency 250V DC, Rev. 32
 61075SH0041, Sch. Dia., Reactor Aux. Letdown Containment Isolation 1CV516, Rev. 13
 61075SH0044, Reactor Auxiliaries RCP Control Bleed Off 1CV505, Rev. 11
 61075SH0053, Reactor Auxiliaries Pressurizer Relief 1ERV402, Rev. 22
 61075SH0053B, Reactor Auxiliary Pressurizer Relief 1ERV404, Rev. 3
 61076SH0014B, Sch. Dia., Reactor Safeguards Containment Isolation 5464, Rev. 13
 61076SH0014K, Sch. Dia., Steam Generator 11 Blowdown Line Isolation valve 1CV4010, Rev. 3
 61076SH0014L, Sch. Dia., Steam Generator 11 Blowdown Line Isolation Valve 1CV4011, Rev. 2
 61076SH0014M, Sch. Dia., Steam Generator 12 Blowdown Line Isolation Valve 1CV4012, Rev. 3
 61076SH0014N, Sch. Dia., Steam Generator 12 Blowdown Line Isolation Valve 1CV4013, Rev. 2
 61402SH0034, Emergency Lighting & Com., EL. 12'-0", Turbine Building, U1 & U2, Rev. 20
 61402SH0036, Emergency Lighting & Com., EL. 45'-0", Turbine Building, U1 & U2, Rev. 10
 61402SH0039, Emergency Lighting & Com., Control Room/Aux. Building, U1 & U2, Rev. 2
 61402SH0041, Emergency Lighting & Com., Diesel Generator Building, Rev. 6
 61402SH0044, Emergency Lighting & Com., Diesel Generator (SBO) Building, Rev. 2
 61402SH0045, Emergency Lighting & Com., Diesel Generator (SBO) Building, Rev. 5
 61406SEC108.1SH0001, Fire Barriers/Stops, Rev. 4
 61406SEC108.1SH0008, Fire Barriers/Stops, Rev. 4
 61406SEC108.1SH0010, Fire Barriers/Stops, Rev. 4
 61406SEC108.3SH0005, Fire Barriers/Stops, Rev. 5
 62148SH0001, Mechanical Seal Details, Appendix R Fire Barriers, Rev. 9
 62150SH0001, App. R Sep. Req. AUX Bldg. & Cntmt. Structure Floor Plan at El. 5'-0", Rev. 7
 62150SH0047, Barrier Segment Drawing for Plant Evaluation 5'-0", Re. 0
 62151SH0001, App. R Sep. Req. AUX Bldg. & Cntmt. Structure Floor Plan at El. 27'-0", Rev. 9
 62151SH0006, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
 62151SH0007, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
 62151SH0018, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
 62151SH0019, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
 62151SH0023, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0

62151SH0025, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
62151SH0027, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 0
62151SH0054, Barrier Segment Drawing for Plan Elevation 27'-0", Rev. 1
62152SH0001, App. R Sep. Req. AUX Bldg. & Cntmt. Structure Floor Plan at El. 45'-0", Rev. 11
62152SH0008, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 1
62152SH0011, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 0
62152SH0023, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 0
62152SH0024, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 0
62152SH0025, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 0
62152SH0026, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 1
62152SH0031, Barrier Segment Drawing for Plant Elevation 45'-0", Rev. 1
63402SH0028, Emergency Lighting & Com., Auxiliary Building, Rev. 20

Fire Brigade Drills/Critiques

Fire Drill Scenario 10-01, 69' 11 Misc. Waste Evap. Room
Fire Drill Scenario 10-02, 27' MSIV Hallway ALARA Cage Fire
Fire Drill Scenario 08-07, 1A Diesel
Fire Drill Scenario 08-06, Fire in the Main Transformer
Fire Drill Scenario 08-05, Fire in the Hydrogen Storage Tanks
Fire Drill Scenario 08-04, Fire on the Unit 1 Hydrogen Seal Oil Unit
Fire Drill Scenario 07-09, 69' Aux. Building Unit 2 electrical Room
Fire Drill Scenario 07-08, 45' Aux. Building Truck Bay
Fire Drill Scenario 07-01, Fire in the 69' Chemistry Hot Lab
Fire Drill Scenario 05-01, Fire in a U-4000 Transformer
Fire Drill Scenario 04-01, Flammable Cabinet on Fire in the 0C Diesel Building
Fire Drill Scenario 03-02, Fire on the 72' access Area Roof
Fire Drill Scenario 01-04, Explosion in the U-1 45' Switchgear Room
Fire Drill Scenario 95-04, Class A Fire in Unit 1 45' West Penetration Room
Fire Drill Critique Sheet, 1/4/10
Fire Drill Critique Sheet, 1/15/10
Fire Drill Critique Sheet, 1/29/10
Fire Drill Critique Sheet, 2/4/10
Fire Drill Critique Sheet, 2/11/10
Fire Drill Critique Sheet, 2/13/10

Fire Brigade Lesson Plans and Training

FB-FallFS-07, Fall Fire School 2007
FB-FallFS-08, Fall Fire School 2008
FB-FallFS-09, Fall Fire School 2009
FB-FallFS-10, Fall Fire School 2010
Fire Brigade Training Matrix, 11/02/10
Quarterly Fire Brigade Training, 2007 - 2010

Fire Fighting Strategies Manual

U-1, Auxiliary Feed Pump Room, Rev. 1
U-1, Cable Spreading Room, Rev. 00200
U-2, 45' Switchgear Room, Rev. 00300
2B Emergency Diesel Generator Room, Rev. 00101

Fire Protection License Basis Documents

Calvert Cliffs Fire Hazards Analysis Summary Document, Rev. 0
Calvert Cliffs Fire Protection Program
Calvert Cliffs Nuclear Power Plant Updated Final Safety Analysis Report, Section 9.9, Rev. 39
Calvert Cliffs Nuclear Power Plant Technical Requirements Manual (TRM), Rev. 01502
SER Dated 9/14/79, Fire Protection – Calvert Cliffs
SER Dated 10/2/80, Fire Protection – Calvert Cliffs
SER Dated 3/18/82, Fire Protection – Calvert Cliffs
SER Dated 8/6/82, Fire Protection – Calvert Cliffs
SER Dated 9/27/82, Fire Protection – Calvert Cliffs
Exemption Request Dated 8/16/82, Calvert Cliffs
Exemption Request Dated 4/21/83, Calvert Cliffs
Exemption Request Dated 3/15/84, Calvert Cliffs
Exemption Request Dated 6/4/84, Calvert Cliffs
Exemption Dated 8/22/90, Calvert Cliffs
Exemption Request Dated 4/7/99, Calvert Cliffs

Hot Work and Ignition Source Permits

C22090602
C90744583
C90704043
C91041040
C220090602
C220092948

Large Fires and Explosions Mitigation Strategies Documents

ERPIP-611
ERPIP-B.1, Rev. 03400
Maintenance Qualifications, 10/07
SER dated 7/11/07
Training Roster, 5/10/08
WO C90806802
WO C90834237
WO 0200702868

Maintenance Orders

0200402690
1200704103
1200805450

Miscellaneous

Control of Shift Activities (Staffing Both Units Fire Brigade and Operations), 12/1/10
Fire System/Fire Barrier Impairment Log, 12/1/10
Information Notice 06-22 Response
PRA Evaluation Request CO-2010-020, Rev. 2
PRA Evaluation Request CO-2010-021, Rev. 0
PRA Evaluation Request CO-2010-022, Rev. 1
Purchase Order 411517, Rev. 9
Purchase Order 411517-32, Rev. 0
Purchase Order 411517-33, Rev. 0

Operator Safe Shutdown Training

120909, AOP-9, Alternate Safety Shutdown/Control Room Evacuation, 12/10/2010
010340310, Align AFW Pump Speed/Flow Control to 1(2)C43, 10/3/01
020190302, Lineup for ADV Control at 1(2)C43, 8/29/00
010380301, Manually Override SW Valves Using Hand Valves, 8/24/00
010530301, Tie Vital MCCs , 10/02/01
020530305, Manually Operate 480Vac Breakers, 8/29/00
020530313, Operate MCC Feeder Breakers, 8/31/00
020520101, Deenergize/Energize a 4Kv Bus, 8/31/00
020340301, Fill the S/Gs from 1(2) C43, 8/24/00
0143B0301, Operate 11(12) AFW Emergency Vent Fans, 8/28/00
2010 AOP-9 Training Time Results, Jun 2010

Piping and Instrumentation Diagrams

60583SH0001, Auxiliary Feedwater System (Steam), Rev. 63
60583SH0002, Auxiliary Feedwater System (Condensate), Rev. 2
60700SH0001, Main Steam & Reheat, Rev. 47
60706SH0001, Service Water Cooling Turbine Area, Rev. 52
60706SH0002, Service Water Cooling System, Aux. Building & Containment, Rev 75
60710SH0001, Component Cooling System, Rev. 43
60710SH0002, Component Cooling System, Rev. 37
60710SH0003, Component Cooling System, Rev. 45
60729SH0001, Reactor Coolant System, Rev. 78
60729SH0002, Reactor Coolant System, Rev. 28
60730SH0001, Chemical & Volume Control System, Rev. 87
60730SH0002, Chemical & Volume Control System, Rev. 73
60730SH0003, Chemical & Volume Control System, Rev. 44

Procedures

AOP-9B, Safe Shutdown Due to a Severe Cable Spreading Room Fire, Rev. 17 and Rev. 9
AOP-9M, Emergency Removal of Component Cooling Check Valve Internals, Rev. 1
AOP-9Q, Safe Shutdown Due to a Severe Fire in Room 407 Unit 2 Switchgear Room 45', Rev. 11
AOP-9R, Safe Shutdown Due to a Severe Fire in Room 603 Unit 1 Aux. Feed Pump Rm., Rev. 12
ERPIP-3.0, Attachment 16, Fire in the Protected Area, ISFSI, or MPF, Rev. 04900
ERPIP-901, Communications Equipment, Rev. 01200
FPP-09-01-C, Fire Protection Program 6/15-24-09
FTE-89, Cutler Hammer DS-206 and DS-416 Circuit Breaker Inspection, rev. 00200
OI-22H, Switchgear Ventilation and Air Conditioning, Rev. 22
SA-1, Fire Protection Program, Rev. 7
SA-1-100, Fire Protection, Rev. 01700
SA-1-101, Fire Fighting, Rev. 4
SA-1-105, Fire Brigade Training, Rev. 00101
1C04-ALM, Aux Feedwater and Computer Alarm Manual, Rev. 42
Calvert Cliffs Nuclear Power Plant Unit One Control Room Operator Logsheet, Rev. 13
Calvert Cliffs Nuclear Power Plant Unit Two Control Room Operator Logsheet, Rev. 13

Procedure Change Request

PCR-10-02688
PCR-10-07899

Quality Assurance Audits and Self Assessments

SA-2010-000051, Fire Protection Self-Assessment and Benchmarking Plan, 4/7/10
SA-2010-000051, Fire Protection Self-Assessment and Benchmarking Report, 5/28/10
Fire Protection Self-Assessment, Appendix R Safe Shutdown Capability

Specifications

ES-001, Flooding, Rev. 03
ES-056, Fire Protection Codes and Records, Rev. 01

System Health Reports

U1, Electrical 4KV Transformers and Buses, 3rd Quarter 2010
U1, Electrical 480V Transformers and Buses, 3rd Quarter 2010
U1, 125V DC, 3rd Quarter 2010
U1, Electrical 250V DC, 3rd Quarter
U1, Fire: Protection, Deluge, Detection and Barriers, 3rd Quarter 2010
U2, Electrical 4KV Transformers and Buses, 3rd Quarter 2010
U2, 125V DC, 3rd Quarter 2010

Suppression System Test Documents

ANSUL Letter dated 10/13/1981

Report on Halon System Discharge Test No. 81-61

Report on Halon System Discharge Test No. 81-65

Work Orders

C90660857	C90670242	C90709342	C90709337	C90712649	C90737399
C90742075	C90742127	C90742124	C90742441	C90756091	C90767152
C90767962	C90849644	C90857059	C120092549	C220092917	

LIST OF ACRONYMS

AC	Alternating Current
ADAMS	Agencywide Documents Access and Management System
AFW	Auxiliary Feed Water
CCNPP	Calvert Cliffs Nuclear Power Plant
CENG	Constellation Energy Nuclear Group
CFR	Code of Federal Regulations
CR	Condition Report
DRP	Division of Reactor Projects
DRS	Division of Reactor Safety
EDG	Emergency Diesel Generator
FA	Fire Area
FHA	Fire Hazards Analysis
IP	Inspection Procedure
IPE	Individual Plant Examination
IPEEE	Individual Plant Examination of External Events
IR	Inspection Report
JPM	Job Performance Measure
MOV	Motor Operated Valve
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
P&ID	Piping and Instrumentation Drawing
PAR	Publicly Available Records
PORV	Pilot Operated Relief Valve
QA	Quality Assurance
RWT	Refueling Water Tank
SE	Safety Evaluation
SER	Safety Evaluation Report
SRA	Senior Risk Analyst
SUNSI	Sensitive Unclassified Non-Safeguards Information
UFSAR	Updated Final Safety Analysis Report
VCT	Volume Control Tank